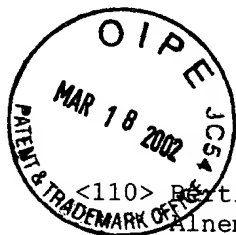SEQUENCE LISTING

<110> Bertin, John
      Alnemri, Emad S.

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      PROTEIN FAMILY AND USES THEREOF

<130> 07334-335001

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gcagctcaag ggttgatctc aggagtccag gacccaggag agggaagaat ctgaggaaca   180
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cggcgtctat ctgtaggtgc cctgggattt ataaaactgg gttccgaatg ctgaataaga   420
gacggtaaga gccaaggcaa aggacagcac tgttctctgc ctgcctgata ccctcaccac   480
ctgggaacat cccccagaca ccctcttaac tccgggacag ag atg gct ggc gga      534
                                               Met Ala Gly Gly
                                                 1

gcc tgg ggc cgc ctg gcc tgt tac ttg gag ttc ctg aag aag gag gag    582
Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu Lys Lys Glu Glu
  5                  10                  15                  20

ctg aag gag ttc cag ctt ctg ctc gcc aat aaa gcg cac tcc agg agc    630
Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala His Ser Arg Ser
                 25                  30                  35

tct tcg ggt gag aca ccc gct cag cca gag aag acg agt ggc atg gag    678
Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr Ser Gly Met Glu
             40                  45                  50

gtg gcc tcg tac ctg gtg gct cag tat ggg gag cag cgg gcc tgg gac    726
```

```
Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln Arg Ala Trp Asp
         55                      60                  65
```

```
cta gcc ctc cat acc tgg gag cag atg ggg ctg agg tca ctg tgc gcc    774
Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg Ser Leu Cys Ala
         70                      75                  80
```

```
caa gcc cag gaa ggg gca ggc cac tct ccc tca ttc ccc tac agc cca    822
Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe Pro Tyr Ser Pro
 85                      90                  95                 100
```

```
agt gaa ccc cac ctg ggg tct ccc agc caa ccc acc tcc acc gca gtg    870
Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr Ser Thr Ala Val
                 105                     110                 115
```

```
cta atg ccc tgg atc cat gaa ttg ccg gcg ggg tgc acc cag ggc tca    918
Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys Thr Gln Gly Ser
                 120                     125                 130
```

```
gag aga agg gtt ttg aga cag ctg cct gac aca tct gga cgc cgc tgg    966
Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser Gly Arg Arg Trp
                 135                     140                 145
```

```
aga gaa atc tct gcc tca ctc ctc tac caa gct ctt cca agc tcc cca   1014
Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu Pro Ser Ser Pro
         150                     155                 160
```

```
gac cat gag tct cca agc cag gag tca ccc aac gcc ccc aca tcc aca   1062
Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala Pro Thr Ser Thr
165                     170                 175                 180
```

```
gca gtg ctg ggg agc tgg gga tcc cca cct cag ccc agc cta gca ccc   1110
Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro Ser Leu Ala Pro
                 185                     190                 195
```

```
aga gag cag gag gct cct ggg acc caa tgg cct ctg gat gaa acg tca   1158
Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu Asp Glu Thr Ser
                 200                     205                 210
```

```
gga att tac tac aca gaa atc aga gaa aga gag aga gag aaa tca gag   1206
Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg Glu Lys Ser Glu
                 215                     220                 225
```

```
aaa ggc agg ccc cca tgg gca gcg gtg gta gga acg ccc cca cag gcg   1254
Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr Pro Pro Gln Ala
         230                     235                 240
```

```
cac acc agc cta cag ccc cac cac cac cca tgg gag cct tct gtg aga   1302
His Thr Ser Leu Gln Pro His His His Pro Trp Glu Pro Ser Val Arg
245                     250                     255                 260
```

```
gag agc ctc tgt tcc aca tgg ccc tgg aaa aat gag gat ttt aac caa   1350
Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu Asp Phe Asn Gln
                 265                     270                 275
```

```
aaa ttc aca cag ctg cta ctt cta caa aga cct cac ccc aga agc caa   1398
Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His Pro Arg Ser Gln
```

```
                    280                    285                    290

gat ccc ctg gtc aag aga agc tgg cct gat tat gtg gag gag aat cga         1446
Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val Glu Glu Asn Arg
        295                    300                    305

gga cat tta att gag atc aga gac tta ttt ggc cca ggc ctg gat acc         1494
Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro Gly Leu Asp Thr
        310                    315                    320

caa gaa cct cgc ata gtc ata ctg cag ggg gct gct gga att ggg aag         1542
Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala Gly Ile Gly Lys
325                    330                    335                    340

tca aca ctg gcc agg cag gtg aag gaa gcc tgg ggg aga ggc cag ctg         1590
Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly Arg Gly Gln Leu
                345                    350                    355

tat ggg gac cgc ttc cag cat gtc ttc tac ttc agc tgc aga gag ctg         1638
Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser Cys Arg Glu Leu
                360                    365                    370

gcc cag tcc aag gtg gtg agt ctc gct gag ctc atc gga aaa gat ggg         1686
Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile Gly Lys Asp Gly
                375                    380                    385

aca gcc act ccg gct ccc att aga cag atc ctg tct agg cca gag cgg         1734
Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser Arg Pro Glu Arg
        390                    395                    400

ctg ctc ttc atc ctc gat ggt gta gat gag cca gga tgg gtc ttg cag         1782
Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly Trp Val Leu Gln
405                    410                    415                    420

gag ccg agt tct gag ctc tgt ctg cac tgg agc cag cca cag ccg gcg         1830
Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln Pro Gln Pro Ala
                425                    430                    435

gat gca ctg ctg ggc agt ttg ctg ggg aaa act ata ctt ccc gag gca         1878
Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile Leu Pro Glu Ala
                440                    445                    450

tcc ttc ctg atc acg gct cgg acc aca gct ctg cag aac ctc att cct         1926
Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln Asn Leu Ile Pro
                455                    460                    465

tct ttg gag cag gca cgt tgg gta gag gtc ctg ggg ttc tct gag tcc         1974
Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly Phe Ser Glu Ser
        470                    475                    480

agc agg aag gaa tat ttc tac aga tat ttc aca gat gaa agg caa gca         2022
Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp Glu Arg Gln Ala
485                    490                    495                    500

att aga gcc ttt agg ttg gtc aaa tca aac aaa gag ctc tgg gcc ctg         2070
Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu Leu Trp Ala Leu
                505                    510                    515
```

```
tgt ctt gtg ccc tgg gtg tcc tgg ctg gcc tgc act tgc ctg atg cag    2118
Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr Cys Leu Met Gln
            520             525                 530

cag atg aag cgg aag gaa aaa ctc aca ctg act tcc aag acc acc aca    2166
Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser Lys Thr Thr Thr
            535             540                 545

acc ctc tgt cta cat tac ctt gcc cag gct ctc caa gct cag cca ttg    2214
Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln Ala Gln Pro Leu
            550             555                 560

gga ccc cag ctc aga gac ctc tgc tct ctg gct gct gag ggc atc tgg    2262
Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala Glu Gly Ile Trp
565             570             575                 580

caa aaa aag acc ctt ttc agt cca gat gac ctc agg aag cat ggg tta    2310
Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg Lys His Gly Leu
                585             590             595

gat ggg gcc atc atc tcc acc ttc ttg aag atg ggt att ctt caa gag    2358
Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly Ile Leu Gln Glu
                600             605                 610

cac ccc atc cct ctg agc tac agc ttc att cac ctc tgt ttc caa gag    2406
His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu Cys Phe Gln Glu
                615             620             625

ttc ttt gca gca atg tcc tat gtc ttg gag gat gag aag ggg aga ggt    2454
Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu Lys Gly Arg Gly
        630             635             640

aaa cat tct aat tgc atc ata gat ttg gaa aag acg cta gaa gca tat    2502
Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr Leu Glu Ala Tyr
645             650             655                 660

gga ata cat ggc ctg ttt ggg gca tca acc aca cgt ttc cta ttg ggc    2550
Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg Phe Leu Leu Gly
                665             670                 675

ctg tta agt gat gag ggg gag aga gag atg gag aac atc ttt cac tgc    2598
Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn Ile Phe His Cys
                680             685                 690

cgg ctg tct cag ggg agg aac ctg atg cag tgg gtc ccg tcc ctg cag    2646
Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val Pro Ser Leu Gln
            695             700             705

ctg ctg ctg cag cca cac tct ctg gag tcc ctc cac tgc ttg tac gag    2694
Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His Cys Leu Tyr Glu
    710             715             720

act cgg aac aaa acg ttc ctg aca caa gtg atg gcc cat ttc gaa gaa    2742
Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala His Phe Glu Glu
725             730             735             740
```

```
atg ggc atg tgt gta gaa aca gac atg gag ctc tta gtg tgc act ttc    2790
Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu Val Cys Thr Phe
                745             750             755

tgc att aaa ttc agc cgc cac gtg aag aag ctt cag ctg att gag ggc    2838
Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln Leu Ile Glu Gly
            760             765             770

agg cag cac aga tca aca tgg agc ccc acc atg gta gtc ctg ttc agg    2886
Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val Val Leu Phe Arg
            775             780             785

tgg gtc cca gtc aca gat gcc tat tgg cag att ctc ttc tcc gtc ctc    2934
Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu Phe Ser Val Leu
        790             795             800

aag gtc acc aga aac ctg aag gag ctg gac cta agt gga aac tcg ctg    2982
Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser Gly Asn Ser Leu
805             810             815             820

agc cac tct gca gtg aag agt ctt tgt aag acc ctg aga cgc cct cgc    3030
Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu Arg Arg Pro Arg
                825             830             835

tgc ctc ctg gag acc ctg cgg ttg gct ggc tgt ggc ctc aca gct gag    3078
Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly Leu Thr Ala Glu
            840             845             850

gac tgc aag gac ctt gcc ttt ggg ctg aga gcc aac cag acc ctg acc    3126
Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn Gln Thr Leu Thr
            855             860             865

gag ctg gac ctg agc ttc aat gtg ctc acg gat gct gga gcc aaa cac    3174
Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala Gly Ala Lys His
        870             875             880

ctt tgc cag aga ctg aga cag ccg agc tgc aag cta cag cga ctg cag    3222
Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu Gln Arg Leu Gln
885             890             895             900

ctg gtc agc tgt ggc ctc acg tct gac tgc tgc cag gac ctg gcc tct    3270
Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln Asp Leu Ala Ser
                905             910             915

gtg ctt agt gcc agc ccc agc ctg aag gag cta gac ctg cag cag aac    3318
Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp Leu Gln Gln Asn
                920             925             930

aac ctg gat gac gtt ggc gtg cga ctg ctc tgt gag ggg ctc agg cat    3366
Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu Gly Leu Arg His
            935             940             945

cct gcc tgc aaa ctc ata cgc ctg ggg ctg gac cag aca act ctg agt    3414
Pro Ala Cys Lys Leu Ile Arg Leu Gly Leu Asp Gln Thr Thr Leu Ser
        950             955             960

gat gag atg agg cag gaa ctg agg gcc ctg gag cag gag aaa cct cag    3462
```

Asp Glu Met Arg Gln Glu Leu Arg Ala Leu Glu Gln Glu Lys Pro Gln
965   970   975   980

```
ctg ctc atc ttc agc aga cgg aaa cca agt gtg atg acc cct act gag    3510
Leu Leu Ile Phe Ser Arg Arg Lys Pro Ser Val Met Thr Pro Thr Glu
                985                 990                 995
```

```
ggc ctg gat acg gga gag atg agt aat agc aca tcc tca ctc aag cgg    3558
Gly Leu Asp Thr Gly Glu Met Ser Asn Ser Thr Ser Ser Leu Lys Arg
            1000                1005                1010
```

```
cag aga ctc gga tca gag agg gcg gct tcc cat gtt gct cag gct aat    3606
Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser His Val Ala Gln Ala Asn
            1015                1020                1025
```

```
ctc aaa ctc ctg gac gtg agc aag atc ttc cca att gct gag att gca    3654
Leu Lys Leu Leu Asp Val Ser Lys Ile Phe Pro Ile Ala Glu Ile Ala
            1030                1035                1040
```

```
gag gaa agc tcc cca gag gta gta ccg gtg gaa ctc ttg tgc gtg cct    3702
Glu Glu Ser Ser Pro Glu Val Val Pro Val Glu Leu Leu Cys Val Pro
1045                1050                1055                1060
```

```
tct cct gcc tct caa ggg gac ctg cat acg aag cct ttg ggg act gac    3750
Ser Pro Ala Ser Gln Gly Asp Leu His Thr Lys Pro Leu Gly Thr Asp
                1065                1070                1075
```

```
gat gac ttc tgg ggc ccc acg ggg cct gtg gct act gag gta gtt gac    3798
Asp Asp Phe Trp Gly Pro Thr Gly Pro Val Ala Thr Glu Val Val Asp
            1080                1085                1090
```

```
aaa gaa aag aac ttg tac cga gtt cac ttc cct gta gct ggc tcc tac    3846
Lys Glu Lys Asn Leu Tyr Arg Val His Phe Pro Val Ala Gly Ser Tyr
                1095                1100                1105
```

```
cgc tgg ccc aac acg ggt ctc tgc ttt gtg atg aga gaa gcg gtg acc    3894
Arg Trp Pro Asn Thr Gly Leu Cys Phe Val Met Arg Glu Ala Val Thr
            1110                1115                1120
```

```
gtt gag att gaa ttc tgt gtg tgg gac cag ttc ctg ggt gag atc aac    3942
Val Glu Ile Glu Phe Cys Val Trp Asp Gln Phe Leu Gly Glu Ile Asn
1125                1130                1135                1140
```

```
cca cag cac agc tgg atg gtg gca ggg cct ctg ctg gac atc aag gct    3990
Pro Gln His Ser Trp Met Val Ala Gly Pro Leu Leu Asp Ile Lys Ala
                1145                1150                1155
```

```
gag cct gga gct gtg gaa gct gtg cac ctc cct cac ttt gtg gct ctc    4038
Glu Pro Gly Ala Val Glu Ala Val His Leu Pro His Phe Val Ala Leu
            1160                1165                1170
```

```
caa ggg ggc cat gtg gac aca tcc ctg ttc caa atg gcc cac ttt aaa    4086
Gln Gly Gly His Val Asp Thr Ser Leu Phe Gln Met Ala His Phe Lys
            1175                1180                1185
```

```
gag gag ggg atg ctc ctg gag aag cca gcc agg gtg gag ctg cat cac    4134
Glu Glu Gly Met Leu Leu Glu Lys Pro Ala Arg Val Glu Leu His His
```

```
          1190                    1195                    1200

ata gtt ctg gaa aac ccc agc ttc tcc ccc ttg gga gtc ctc ctg aaa      4182
Ile Val Leu Glu Asn Pro Ser Phe Ser Pro Leu Gly Val Leu Leu Lys
1205                    1210                    1215                    1220

atg atc cat aat gcc ctg cgc ttc att ccc gtc acc tct gtg gtg ttg      4230
Met Ile His Asn Ala Leu Arg Phe Ile Pro Val Thr Ser Val Val Leu
                        1225                    1230                    1235

ctt tac cac cgc gtc cat cct gag gaa gtc acc ttc cac ctc tac ctg      4278
Leu Tyr His Arg Val His Pro Glu Glu Val Thr Phe His Leu Tyr Leu
                  1240                    1245                    1250

atc cca agt gac tgc tcc att cgg aag gaa ctg gag ctc tgc tat cga      4326
Ile Pro Ser Asp Cys Ser Ile Arg Lys Glu Leu Glu Leu Cys Tyr Arg
                  1255                    1260                    1265

agc cct gga gaa gac cag ctg ttc tcg gag ttc tac gtt ggc cac ttg      4374
Ser Pro Gly Glu Asp Gln Leu Phe Ser Glu Phe Tyr Val Gly His Leu
            1270                    1275                    1280

gga tca ggg atc agg ctg caa gtg aaa gac aag aaa gat gag act ctg      4422
Gly Ser Gly Ile Arg Leu Gln Val Lys Asp Lys Lys Asp Glu Thr Leu
1285                    1290                    1295                    1300

gtg tgg gag gcc ttg gtg aaa cca gga gat ctc atg cct gca act act      4470
Val Trp Glu Ala Leu Val Lys Pro Gly Asp Leu Met Pro Ala Thr Thr
                        1305                    1310                    1315

ctg atc cct cca gcc cgc ata gcc gta cct tca cct ctg gat gcc ccg      4518
Leu Ile Pro Pro Ala Arg Ile Ala Val Pro Ser Pro Leu Asp Ala Pro
                  1320                    1325                    1330

cag ttg ctg cac ttt gtg gac cag tat cga gag cag ctg ata gcc cga      4566
Gln Leu Leu His Phe Val Asp Gln Tyr Arg Glu Gln Leu Ile Ala Arg
                  1335                    1340                    1345

gtg aca tcg gtg gag gtt gtc ttg gac aaa ctg cat gga cag gtg ctg      4614
Val Thr Ser Val Glu Val Val Leu Asp Lys Leu His Gly Gln Val Leu
            1350                    1355                    1360

agc cag gag cag tac gag agg gtg ctg gct gag aac acg agg ccc agc      4662
Ser Gln Glu Gln Tyr Glu Arg Val Leu Ala Glu Asn Thr Arg Pro Ser
1365                    1370                    1375                    1380

cag atg cgg aag ctg ttc agc ttg agc cag tcc tgg gac cgg aag tgc      4710
Gln Met Arg Lys Leu Phe Ser Leu Ser Gln Ser Trp Asp Arg Lys Cys
                        1385                    1390                    1395

aaa gat gga ctc tac caa gcc ctg aag gag acc cat cct cac ctc att      4758
Lys Asp Gly Leu Tyr Gln Ala Leu Lys Glu Thr His Pro His Leu Ile
                  1400                    1405                    1410

atg gaa ctc tgg gag aag ggc agc aaa aag gga ctc ctg cca ctc agc      4806
Met Glu Leu Trp Glu Lys Gly Ser Lys Lys Gly Leu Leu Pro Leu Ser
            1415                    1420                    1425
```

```
agc tgaagtatca acaccagccc ttgacccttg agtcctggct ttggctgacc          4859
Ser
```

```
cttctttggg tctcagtttc tttctctgca aacaagttgc catctggttt gccttccagc   4919
actaaagtaa tggaactttg atgatgcctt tgctgggcat tatgtgtcca tgccagggat   4979
gccacagggg gccccagtcc aggtggccta acagcatctc aggaatgtc catctggagc    5039
tggcaagacc cctgcagacc tcatagagcc tcatctggtg gccacagcag ccaagcctag   5099
agccctccgg atcccatcca ggcgcaaaga ggaataggag ggacatggaa ccatttgcct   5159
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Met Ala Gly Gly Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu
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Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
            20                  25                  30
His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
        35                  40                  45
Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
    50                  55                  60
Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
65                  70                  75                  80
Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                85                  90                  95
Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
            100                 105                 110
Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
        115                 120                 125
Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
    130                 135                 140
Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145                 150                 155                 160
Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                165                 170                 175
Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
            180                 185                 190
Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
        195                 200                 205
Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
    210                 215                 220
Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225                 230                 235                 240
Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
                245                 250                 255
Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
            260                 265                 270
Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
```

```
                275                    280                    285
Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
    290                    295                    300
Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305                    310                    315                    320
Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                325                    330                    335
Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
        340                    345                    350
Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
    355                    360                    365
Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
    370                    375                    380
Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385                    390                    395                    400
Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
                405                    410                    415
Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
            420                    425                    430
Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
        435                    440                    445
Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
    450                    455                    460
Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465                    470                    475                    480
Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
                485                    490                    495
Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
            500                    505                    510
Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
            515                    520                    525
Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
    530                    535                    540
Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545                    550                    555                    560
Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
                565                    570                    575
Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
            580                    585                    590
Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
        595                    600                    605
Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
    610                    615                    620
Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625                    630                    635                    640
Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
                645                    650                    655
Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
            660                    665                    670
Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
            675                    680                    685
Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
    690                    695                    700
Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705                    710                    715                    720
Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
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His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
        740   745   750
Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
        755   760   765
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
    770   775   780
Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785   790   795   800
Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                805   810   815
Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
            820   825   830
Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
        835   840   845
Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
    850   855   860
Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
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Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
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Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
            900   905   910
Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
        915   920   925
Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
    930   935   940
Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Leu Asp Gln
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Thr Thr Leu Ser Asp Glu Met Arg Gln Glu Leu Arg Ala Leu Glu Gln
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Glu Lys Pro Gln Leu Leu Ile Phe Ser Arg Arg Lys Pro Ser Val Met
            980   985   990
Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser Thr Ser
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Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser His Val
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Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe Pro Ile
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Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val Glu Leu
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Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr Lys Pro
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Leu Gly Thr Asp Asp Asp Phe Trp Gly Pro Thr Gly Pro Val Ala Thr
            1075   1080   1085
Glu Val Val Asp Lys Glu Lys Asn Leu Tyr Arg Val His Phe Pro Val
    1090   1095   1100
Ala Gly Ser Tyr Arg Trp Pro Asn Thr Gly Leu Cys Phe Val Met Arg
1105   1110   1115   1120
Glu Ala Val Thr Val Glu Ile Glu Phe Cys Val Trp Asp Gln Phe Leu
            1125   1130   1135
Gly Glu Ile Asn Pro Gln His Ser Trp Met Val Ala Gly Pro Leu Leu
        1140   1145   1150
Asp Ile Lys Ala Glu Pro Gly Ala Val Glu Ala Val His Leu Pro His
        1155   1160   1165
Phe Val Ala Leu Gln Gly Gly His Val Asp Thr Ser Leu Phe Gln Met
    1170   1175   1180
Ala His Phe Lys Glu Glu Gly Met Leu Leu Glu Lys Pro Ala Arg Val

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1185                 1190                1195                1200
Glu Leu His His Ile Val Leu Glu Asn Pro Ser Phe Ser Pro Leu Gly
             1205                1210                1215
Val Leu Leu Lys Met Ile His Asn Ala Leu Arg Phe Ile Pro Val Thr
         1220                1225                1230
Ser Val Val Leu Leu Tyr His Arg Val His Pro Glu Glu Val Thr Phe
         1235                1240                1245
His Leu Tyr Leu Ile Pro Ser Asp Cys Ser Ile Arg Lys Glu Leu Glu
     1250                1255                1260
Leu Cys Tyr Arg Ser Pro Gly Glu Asp Gln Leu Phe Ser Glu Phe Tyr
1265                1270                1275                1280
Val Gly His Leu Gly Ser Gly Ile Arg Leu Gln Val Lys Asp Lys Lys
             1285                1290                1295
Asp Glu Thr Leu Val Trp Glu Ala Leu Val Lys Pro Gly Asp Leu Met
         1300                1305                1310
Pro Ala Thr Thr Leu Ile Pro Pro Ala Arg Ile Ala Val Pro Ser Pro
         1315                1320                1325
Leu Asp Ala Pro Gln Leu Leu His Phe Val Asp Gln Tyr Arg Glu Gln
     1330                1335                1340
Leu Ile Ala Arg Val Thr Ser Val Glu Val Val Leu Asp Lys Leu His
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Gly Gln Val Leu Ser Gln Glu Gln Tyr Glu Arg Val Leu Ala Glu Asn
             1365                1370                1375
Thr Arg Pro Ser Gln Met Arg Lys Leu Phe Ser Leu Ser Gln Ser Trp
         1380                1385                1390
Asp Arg Lys Cys Lys Asp Gly Leu Tyr Gln Ala Leu Lys Glu Thr His
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Pro His Leu Ile Met Glu Leu Trp Glu Lys Gly Ser Lys Lys Gly Leu
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Leu Pro Leu Ser Ser
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gtgcaagcat ctgggccatc ttcaatggta aaaaagatac agtaaagaca taaataccac     180
atttgacaaa tggaaaaaaa ggagtgtcca gaaaagagta gcagcagtga ggaagagctg     240
ccgagacggg tatacaggga gctaccctgt gtttctgaga cccttttgtga catctcacat     300
tttttccaag aag atg atg aga cag agg cag agc cat tat tgt tcc gtg        349
                Met Met Arg Gln Arg Gln Ser His Tyr Cys Ser Val
                 1                 5                  10
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ctg ttc ctg agt gtc aac tat ctg ggg ggg aca ttc cca gga gac att      397
Leu Phe Leu Ser Val Asn Tyr Leu Gly Gly Thr Phe Pro Gly Asp Ile
         15                 20                 25
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tgc tca gaa gag aat caa ata gtt tcc tct tat gct tct aaa gtc tgt      445
Cys Ser Glu Glu Asn Gln Ile Val Ser Ser Tyr Ala Ser Lys Val Cys
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12

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                30                      35                      40

ttt gag atc gaa gaa gat tat aaa aat cgt cag ttt ctg ggg cct gaa       493
Phe Glu Ile Glu Glu Asp Tyr Lys Asn Arg Gln Phe Leu Gly Pro Glu
 45                      50                      55                  60

gga aat gtg gat gtt gag ttg att gat aag agc aca aac aga tac agc       541
Gly Asn Val Asp Val Glu Leu Ile Asp Lys Ser Thr Asn Arg Tyr Ser
                     65                      70                      75

gtt tgg ttc ccc act gct ggc tgg tat ctg tgg tca gcc aca ggc ctc       589
Val Trp Phe Pro Thr Ala Gly Trp Tyr Leu Trp Ser Ala Thr Gly Leu
                 80                      85                      90

ggc ttc ctg gta agg gat gag gtc aca gtg acg att gcg ttt ggt tcc       637
Gly Phe Leu Val Arg Asp Glu Val Thr Val Thr Ile Ala Phe Gly Ser
             95                     100                     105

tgg agt cag cac ctg gcc ctg gac ctg cag cac cat gaa cag tgg ctg       685
Trp Ser Gln His Leu Ala Leu Asp Leu Gln His His Glu Gln Trp Leu
        110                     115                     120

gtg ggc ggc ccc ttg ttt gat gtc act gca gag cca gag gag gct gtc       733
Val Gly Gly Pro Leu Phe Asp Val Thr Ala Glu Pro Glu Glu Ala Val
125                     130                     135                 140

gcc gaa atc cac ctc ccc cac ttc atc tcc ctc caa ggt gag gtg gac       781
Ala Glu Ile His Leu Pro His Phe Ile Ser Leu Gln Gly Glu Val Asp
                    145                     150                     155

gtc tcc tgg ttt ctc gtt gcc cat ttt aag aat gaa ggg atg gtc ctg       829
Val Ser Trp Phe Leu Val Ala His Phe Lys Asn Glu Gly Met Val Leu
             160                     165                     170

gag cat cca gcc cgg gtg gag cct ttc tat gct gtc ctg gaa agc ccc       877
Glu His Pro Ala Arg Val Glu Pro Phe Tyr Ala Val Leu Glu Ser Pro
        175                     180                     185

agc ttc tct ctg atg ggc atc ctg ctg cgg atc gcc agt ggg act cgc       925
Ser Phe Ser Leu Met Gly Ile Leu Leu Arg Ile Ala Ser Gly Thr Arg
        190                     195                     200

ctc tcc atc ccc atc act tcc aac aca ttg atc tat tat cac ccc cac       973
Leu Ser Ile Pro Ile Thr Ser Asn Thr Leu Ile Tyr Tyr His Pro His
205                     210                     215                 220

ccc gaa gat att aag ttc cac ttg tac ctt gtc ccc agc gac gcc ttg       1021
Pro Glu Asp Ile Lys Phe His Leu Tyr Leu Val Pro Ser Asp Ala Leu
                    225                     230                     235

cta aca aag gcg ata gat gat gag gaa gat cgc ttc cat ggt gtg cgc       1069
Leu Thr Lys Ala Ile Asp Asp Glu Glu Asp Arg Phe His Gly Val Arg
                 240                     245                     250

ctg cag act tcg ccc cca atg gaa ccc ctg aac ttt ggt tcc agt tat       1117
Leu Gln Thr Ser Pro Pro Met Glu Pro Leu Asn Phe Gly Ser Ser Tyr
        255                     260                     265
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att gtg tct aat tct gct aac ctg aaa gta atg ccc aag gag ttg aaa      1165
Ile Val Ser Asn Ser Ala Asn Leu Lys Val Met Pro Lys Glu Leu Lys
    270             275             280

ttg tcc tac agg agc cct gga gaa att cag cac ttc tca aaa ttc tat      1213
Leu Ser Tyr Arg Ser Pro Gly Glu Ile Gln His Phe Ser Lys Phe Tyr
285             290             295             300

gct ggg cag atg aag gaa ccc att caa ctt gag att act gaa aaa aga      1261
Ala Gly Gln Met Lys Glu Pro Ile Gln Leu Glu Ile Thr Glu Lys Arg
            305             310             315

cat ggg act ttg gtg tgg gat act gag gtg aag cca gtg gat ctc cag      1309
His Gly Thr Leu Val Trp Asp Thr Glu Val Lys Pro Val Asp Leu Gln
            320             325             330

ctt gta gct gca tca gcc cct cct cct ttc tca ggt gca gcc ttt gtg      1357
Leu Val Ala Ala Ser Ala Pro Pro Pro Phe Ser Gly Ala Ala Phe Val
            335             340             345

aag gag aac cac cgg caa ctc caa gcc agg atg ggg gac ctg aaa ggg      1405
Lys Glu Asn His Arg Gln Leu Gln Ala Arg Met Gly Asp Leu Lys Gly
    350             355             360

gtg ctc gat gat ctc cag gac aat gag gtt ctt act gag aat gag aag      1453
Val Leu Asp Asp Leu Gln Asp Asn Glu Val Leu Thr Glu Asn Glu Lys
365             370             375             380

gag ctg gtg gag cag gaa aag aca cgg cag agc aag aat gag gcc ttg      1501
Glu Leu Val Glu Gln Glu Lys Thr Arg Gln Ser Lys Asn Glu Ala Leu
            385             390             395

ctg agc atg gtg gag aag aaa ggg gac ctg gcc ctg gac gtg ctc ttc      1549
Leu Ser Met Val Glu Lys Lys Gly Asp Leu Ala Leu Asp Val Leu Phe
            400             405             410

aga agc att agt gaa agg gac cct tac ctc gtg tcc tat ctt aga cag      1597
Arg Ser Ile Ser Glu Arg Asp Pro Tyr Leu Val Ser Tyr Leu Arg Gln
    415             420             425

cag aat ttg taaaatgagt cagttaggta gtctggaaga gagaatccag            1646
Gln Asn Leu
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Asn Gln Ile Val Ser Ser Tyr Ala Ser Lys Val Cys Phe Glu Ile Glu
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Leu Phe Asp Val Thr Ala Glu Pro Glu Glu Ala Val Ala Glu Ile His
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Leu Pro His Phe Ile Ser Leu Gln Gly Glu Val Asp Val Ser Trp Phe
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Arg Val Glu Pro Phe Tyr Ala Val Leu Glu Ser Pro Ser Phe Ser Leu
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Ile Thr Ser Asn Thr Leu Ile Tyr Tyr His Pro His Pro Glu Asp Ile
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Lys Phe His Leu Tyr Leu Val Pro Ser Asp Ala Leu Leu Thr Lys Ala
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Pro Pro Met Glu Pro Leu Asn Phe Gly Ser Ser Tyr Ile Val Ser Asn
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Ser Pro Gly Glu Ile Gln His Phe Ser Lys Phe Tyr Ala Gly Gln Met
            275                   280                   285
Lys Glu Pro Ile Gln Leu Glu Ile Thr Glu Lys Arg His Gly Thr Leu
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Ser Ala Pro Pro Pro Phe Ser Gly Ala Ala Phe Val Lys Glu Asn His
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Gln Glu Lys Thr Arg Gln Ser Lys Asn Glu Ala Leu Leu Ser Met Val
            370                   375                   380
Glu Lys Lys Gly Asp Leu Ala Leu Asp Val Leu Phe Arg Ser Ile Ser
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<210> 6
<211> 1293
<212> DNA
<213> Homo sapiens

<400> 6
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<210> 7
<211> 90
<212> PRT
<213> Homo sapiens

<400> 7
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1               5                   10                  15
Leu Ile Ala Arg Val Thr Asn Val Glu Trp Leu Leu Asp Ala Leu Tyr
            20                  25                  30
Gly Lys Val Leu Thr Asp Glu Gln Tyr Gln Ala Val Arg Ala Glu Pro
        35                  40                  45
Thr Asn Pro Ser Lys Met Arg Lys Leu Phe Ser Phe Thr Pro Ala Trp
```

```
                50                         55                          60
Asn Trp Thr Cys Lys Asp Leu Leu Leu Gln Ala Leu Arg Glu Ser Gln
65                         70                          75                          80
Ser Tyr Leu Val Glu Asp Leu Glu Arg Ser
                85                          90
```

<210> 8
<211> 89
<212> PRT
<213> Homo sapiens

<400> 8

```
Met Asp Ala Lys Ala Arg Asn Cys Leu Leu Gln His Arg Glu Ala Leu
1                          5                         10                          15
Glu Lys Asp Ile Lys Thr Ser Tyr Ile Met Asp His Met Ile Ser Asp
                20                          25                          30
Gly Phe Leu Thr Ile Ser Glu Glu Glu Lys Val Arg Asn Glu Pro Thr
                35                          40                          45
Gln Gln Gln Arg Ala Ala Met Leu Ile Lys Met Ile Leu Lys Lys Asp
                50                          55                          60
Asn Asp Ser Tyr Val Ser Phe Tyr Asn Ala Leu Leu His Glu Gly Tyr
65                          70                          75                          80
Lys Asp Leu Ala Ala Leu Leu His Asp
                85
```

<210> 9
<211> 92
<212> PRT
<213> Homo sapiens

<400> 9

```
Glu Ser His Pro His Ile Gln Leu Leu Lys Ser Asn Arg Glu Leu Leu
1                          5                         10                          15
Val Thr His Ile Arg Asn Thr Gln Cys Leu Val Asp Asn Leu Leu Lys
                20                          25                          30
Asn Asp Tyr Phe Ser Ala Glu Asp Ala Glu Ile Val Cys Ala Cys Pro
                35                          40                          45
Thr Gln Pro Asp Lys Val Arg Lys Ile Leu Asp Leu Val Gln Ser Lys
                50                          55                          60
Gly Glu Glu Val Ser Glu Phe Phe Leu Tyr Leu Leu Gln Gln Leu Ala
65                          70                          75                          80
Asp Ala Tyr Val Asp Leu Arg Pro Trp Leu Leu Glu
                85                          90
```

<210> 10
<211> 89
<212> PRT
<213> Homo sapiens

<400> 10

```
Met Ala Asp Lys Val Leu Lys Glu Lys Arg Lys Leu Phe Ile Arg Ser
1                          5                         10                          15
Met Gly Glu Gly Thr Ile Asn Gly Leu Leu Asp Glu Leu Leu Gln Thr
                20                          25                          30
Arg Val Leu Asn Lys Glu Glu Met Glu Lys Val Lys Arg Glu Asn Ala
                35                          40                          45
Thr Val Met Asp Lys Thr Arg Ala Leu Ile Asp Ser Val Ile Pro Lys
```

```
            50                        55                    60
Gly Ala Gln Ala Cys Gln Ile Cys Ile Thr Tyr Ile Cys Glu Glu Asp
65                        70                    75                    80
Ser Tyr Leu Ala Gly Thr Leu Gly Leu
                    85
```

<210> 11
<211> 89
<212> PRT
<213> Homo sapiens

<400> 11

```
Ile Ala Gln Gln Trp Ile Gln Ser Lys Arg Glu Asp Ile Val Asn Gln
 1                   5                   10                   15
Met Thr Glu Ala Cys Leu Asn Gln Ser Leu Asp Ala Leu Leu Ser Arg
                20                   25                   30
Asp Leu Ile Met Lys Glu Asp Tyr Glu Leu Val Ser Thr Lys Pro Thr
                35                   40                   45
Arg Thr Ser Lys Val Arg Gln Leu Leu Asp Thr Thr Asp Ile Gln Gly
        50                   55                   60
Glu Glu Phe Ala Lys Val Ile Val Gln Lys Leu Lys Asp Asn Lys Gln
65                   70                   75                   80
Met Gly Leu Gln Pro Tyr Pro Glu Ile
                85
```